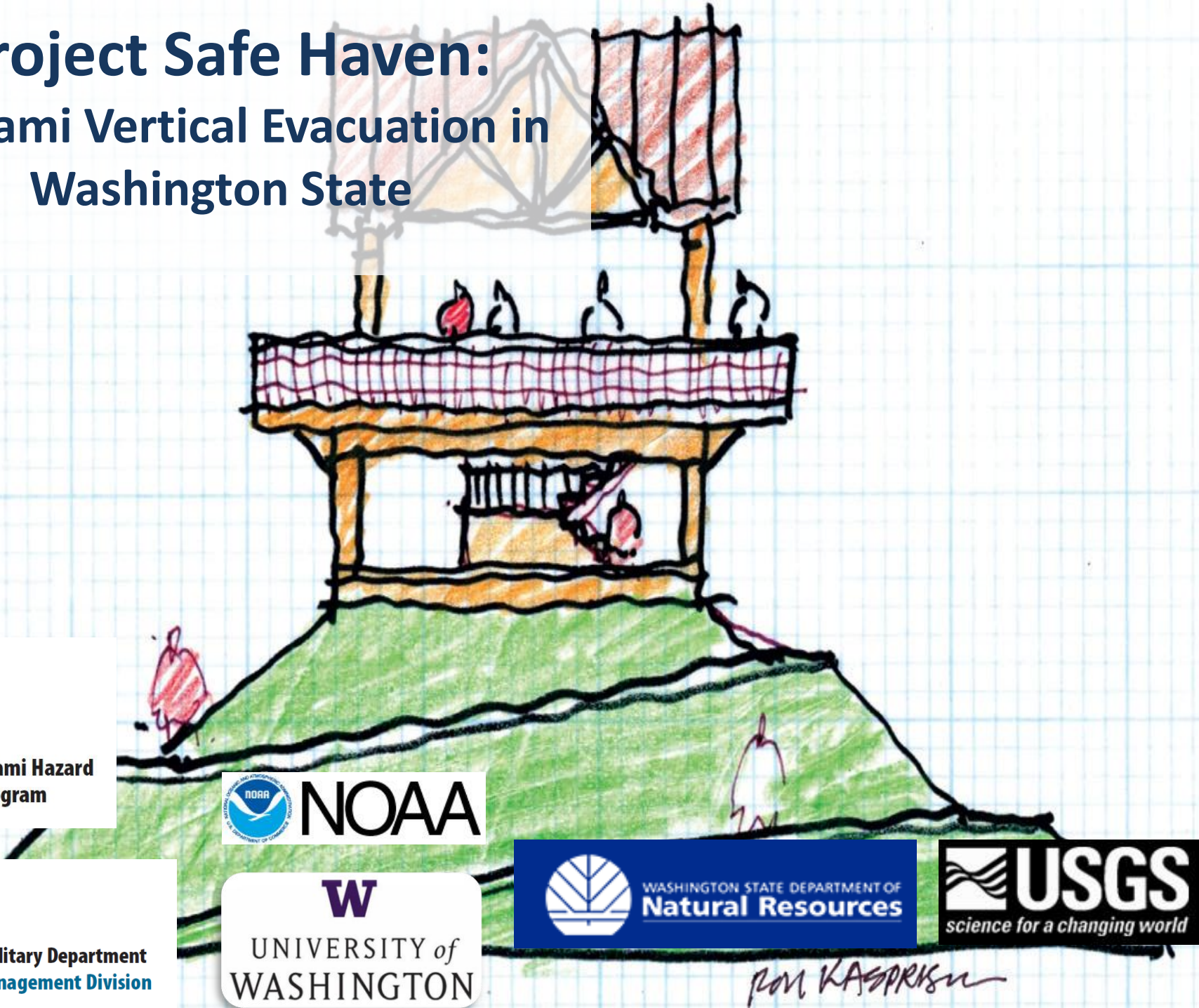
Project Safe Haven:

Tsunami Vertical Evacuation in Washington State



National Tsunami Hazard Mitigation Program

NOAA

Washington Military Department
Emergency Management Division

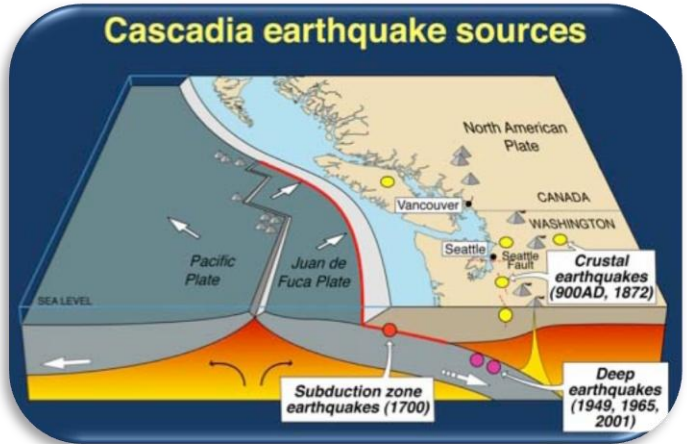
UNIVERSITY of WASHINGTON

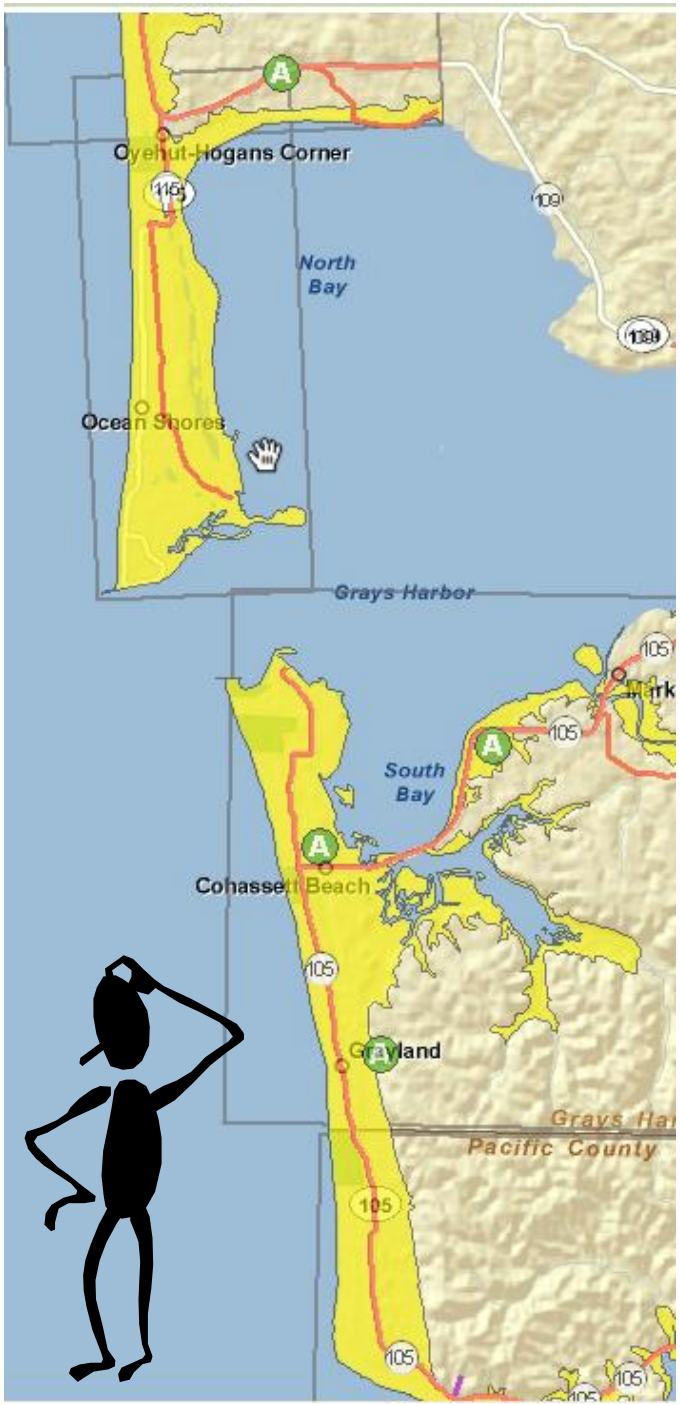
WASHINGTON STATE DEPARTMENT OF Natural Resources

USGS
science for a changing world

Washington Tsunami Hazard Profile:

- **Local Event - Cascadia**
- **~30 minutes before arrival of first wave**
- **Extremely Flat Topography**
- **Majority of Coastal Communities Likely to be Flooded**
- **Vulnerable Populations at Risk**
  - **Seniors**
  - **Children**
- **Untrained Tourist Population**





Current Situation:

Local Earthquake!

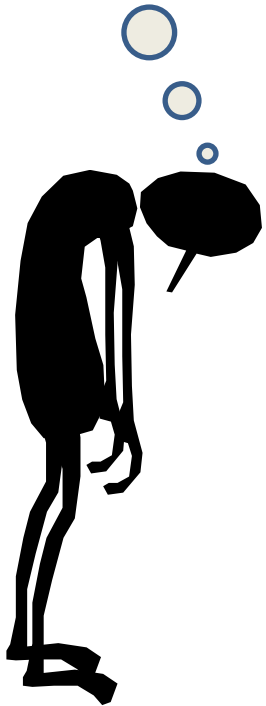
Ah ha!

TSUNAMI EVACUATION ROUTE

High ground: You CAN'T get there from here!

Bummer!

TSUNAMI EVACUATION ROUTE

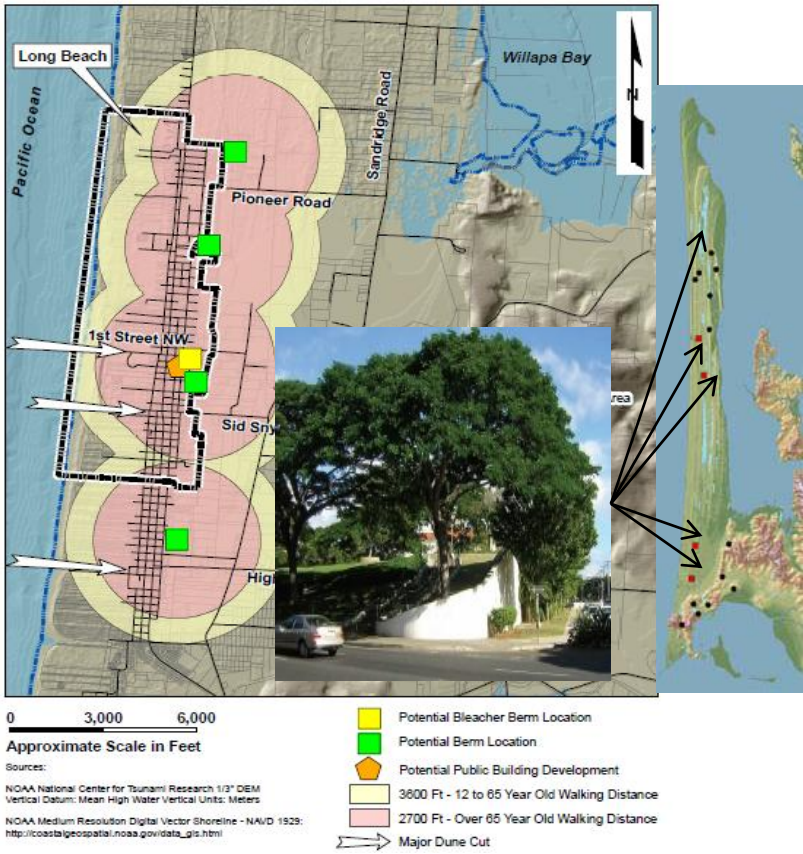


Project Safe Haven:

- ***Community-based, 'top-down' approach***
- All options are on the table for consideration by community participants
- Community members provide 99.9% of the input, experts are on hand to answer technical questions a facilitate the meetings.

– After all, this is the ***<u>community's plan…</u>***

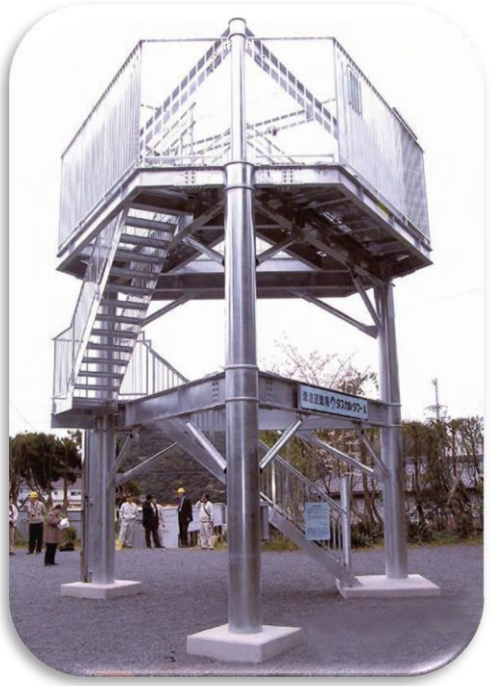
Figure 2 - Preferred Strategy



<u>Common Themes</u>:

- School safety
- Seniors and special needs populations
- More conservative travel times – 15 min. instead of 30 min.
- Requested more conservative estimates of elevations

Safe Haven Options (from FEMA 646):



Towers –
- Limited Space
- Blocks Views
- Few Options for Shelter

Buildings –
- Expensive
  - Better get it right the first time!
- Very Large, Likely to Block Views
- May require Private Development
  - Incentives for Height?

Berms –
- Less Expensive Option for Higher Capacity
- Can be Multi-Purpose
- May be Placed to Limit View Blocking

Safe Haven Planning Process

Kick off Meeting with Local Emergency Manager and Key Stakeholders

Community World Café Meeting

(Gather initial community input)

Alternatives Analysis Development

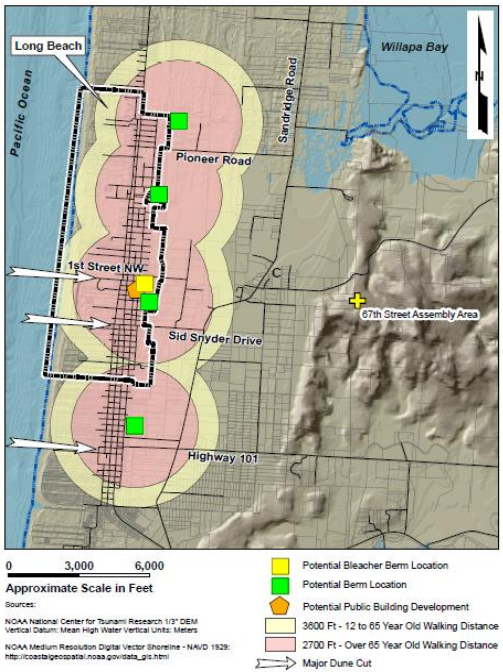
(SWOT)

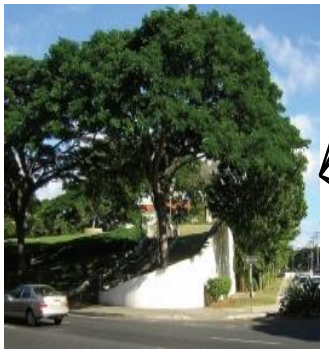
Development of Preferred Alternative

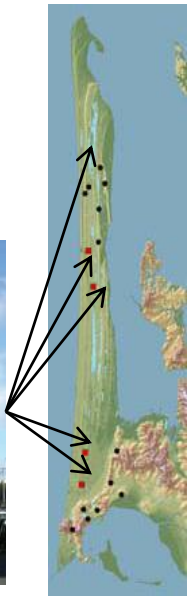
Urban Design Charrette with Community

Community Ranking of Locations & Final Plan Development

Figure 2 - Preferred Strategy





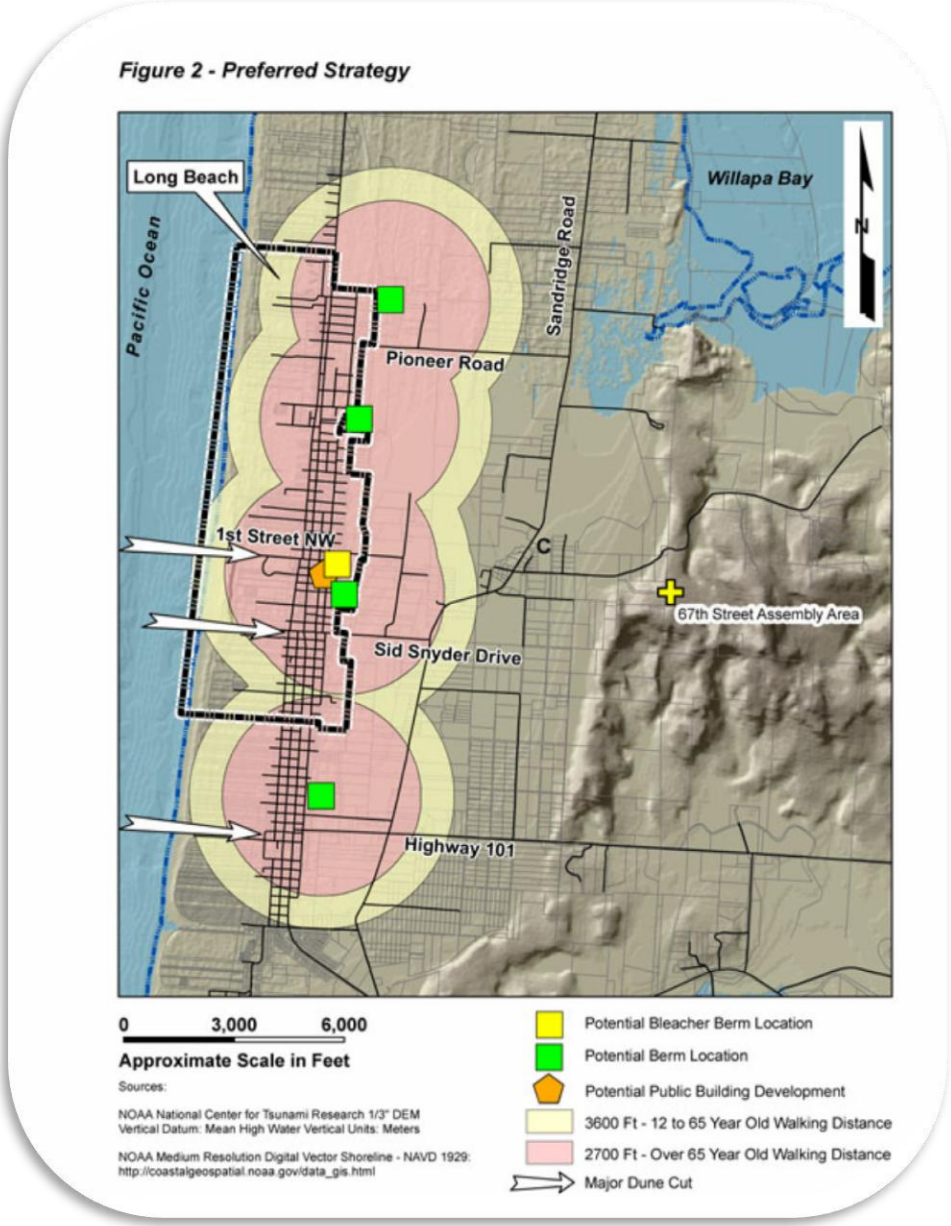


Step 1. Figure out where the community wants these things!

1. City of Long Beach, WA

Preferred Strategy

- Five Berms Distributed Along Eastern Extent of Community
- Potential Public Building Development in Center of Town
- Permanent Residents Able to be Served by Structures
- Will accommodate tourists



4. Tokeland/North Cove, WA

Preferred Strategy

- Focus on towers that can be used for bird watching.

- Leverage casino facility uses and construct elevated parking structure.

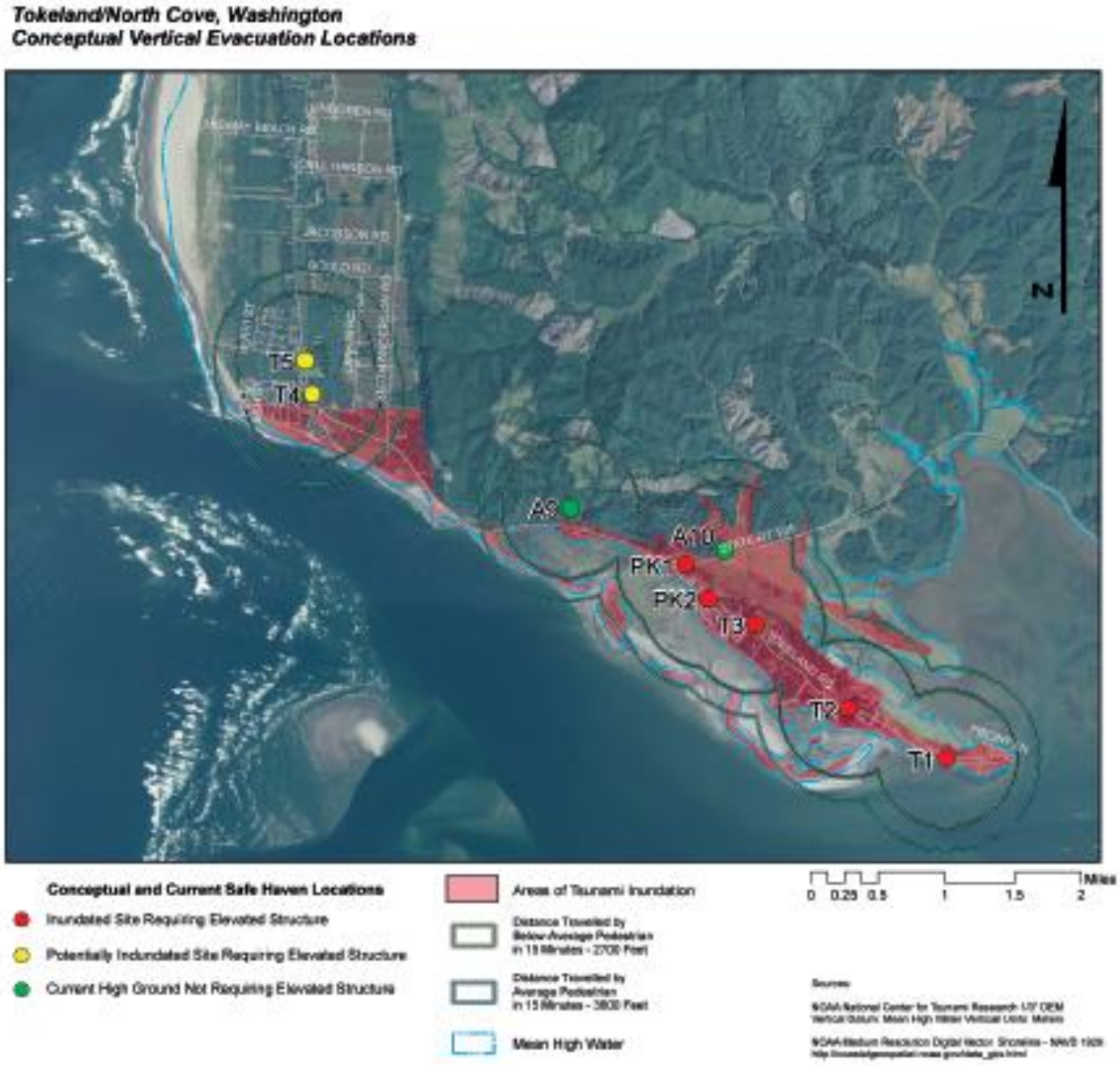
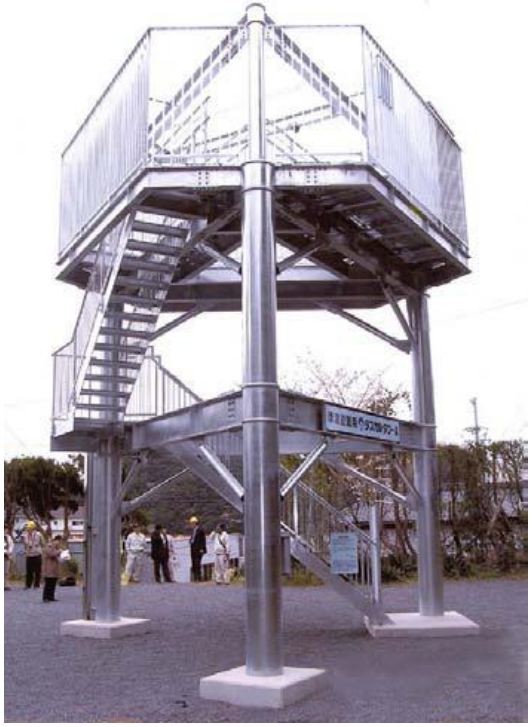


Figure 10: Tokeland/North Cove Strategy

Step 2. Figure out what the community wants these things to look like!



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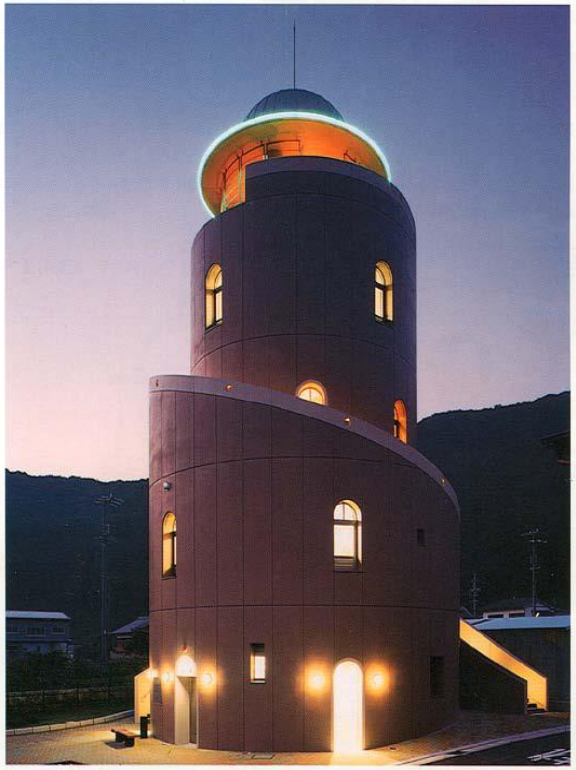
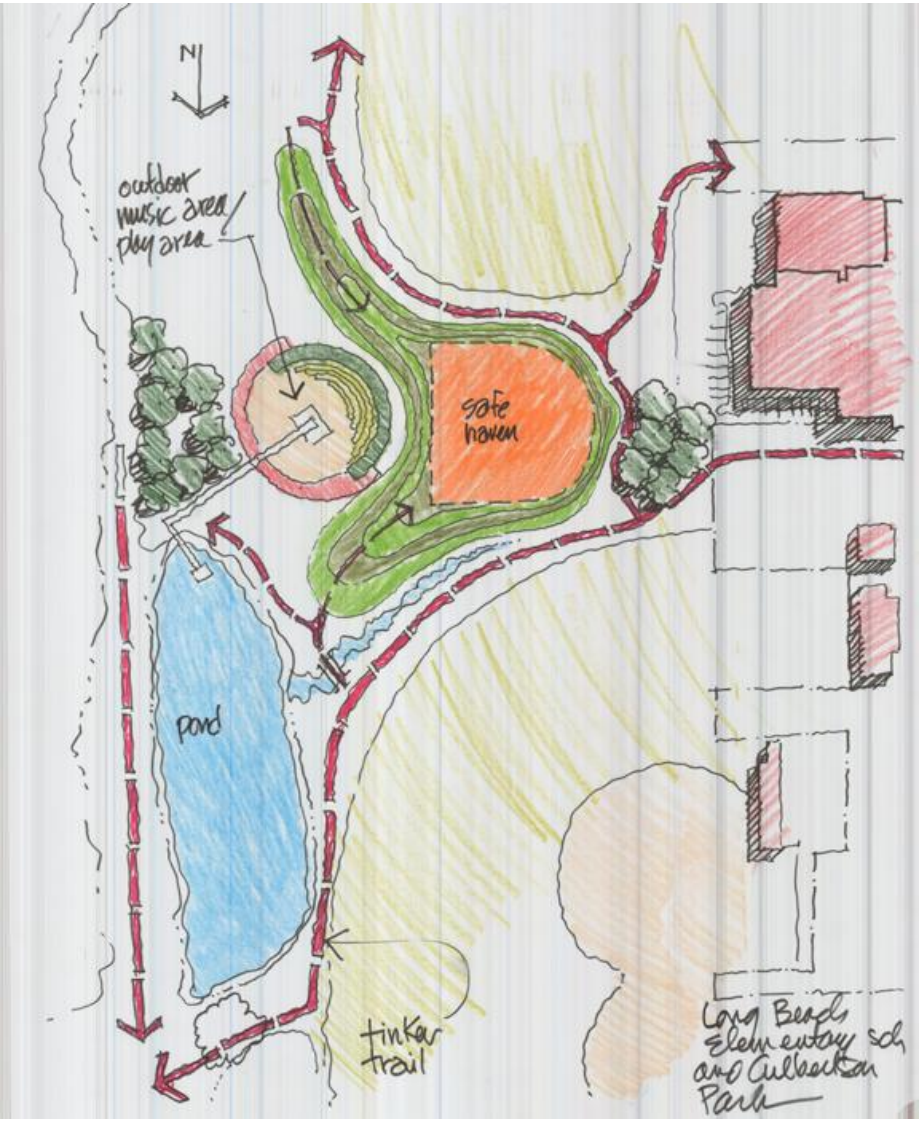
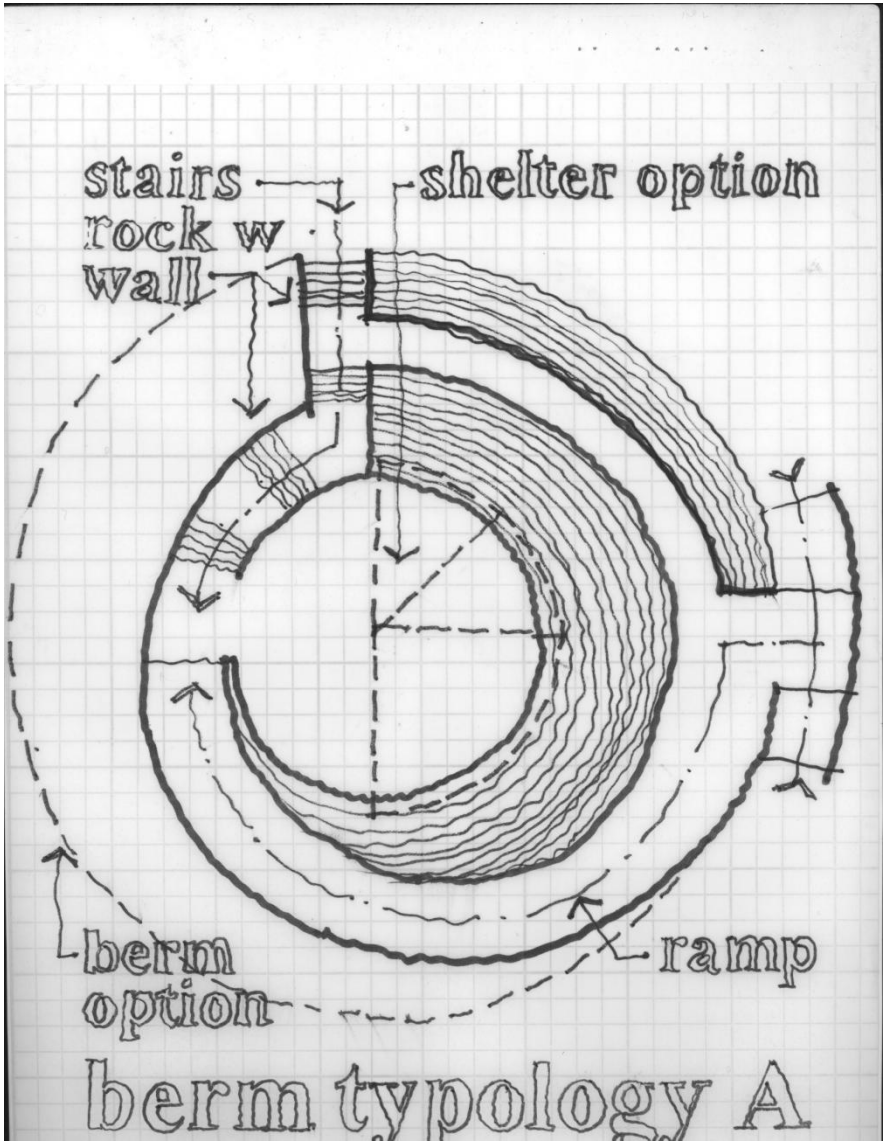


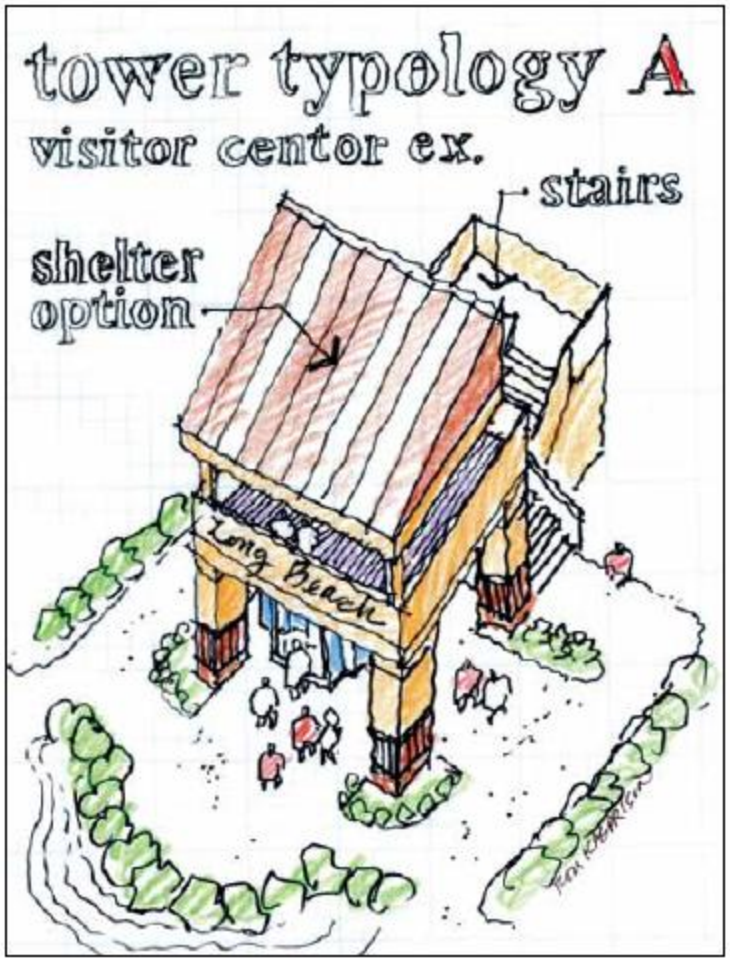
Safe Haven Berms

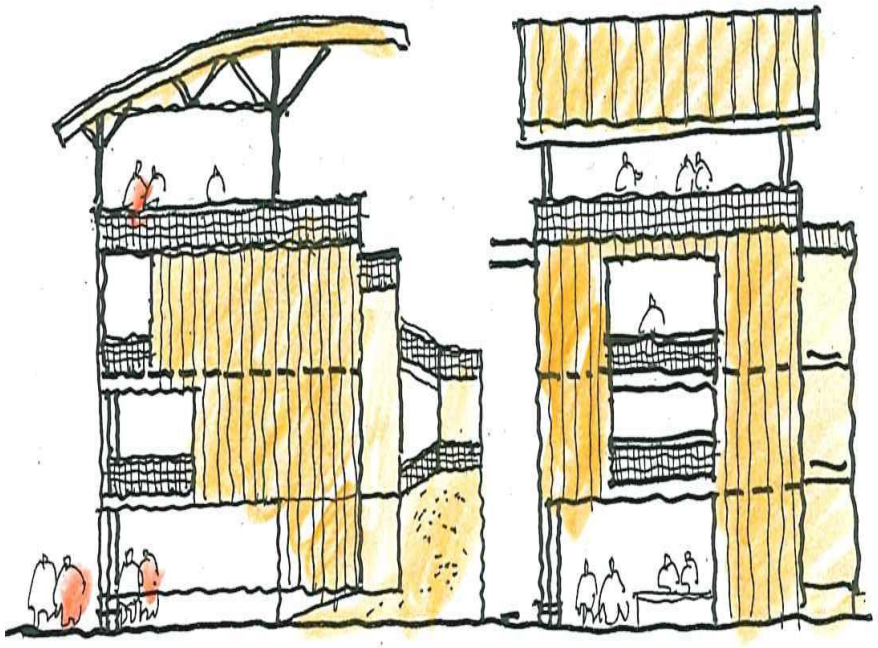


Safe Haven Berms



Safe Haven Towers





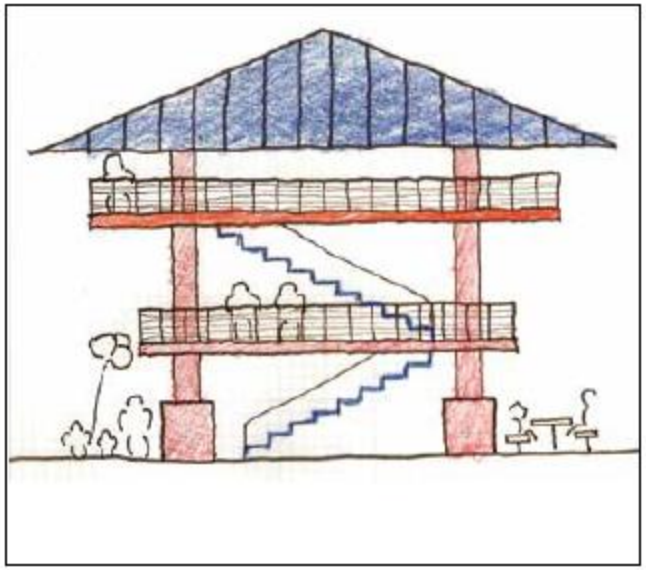
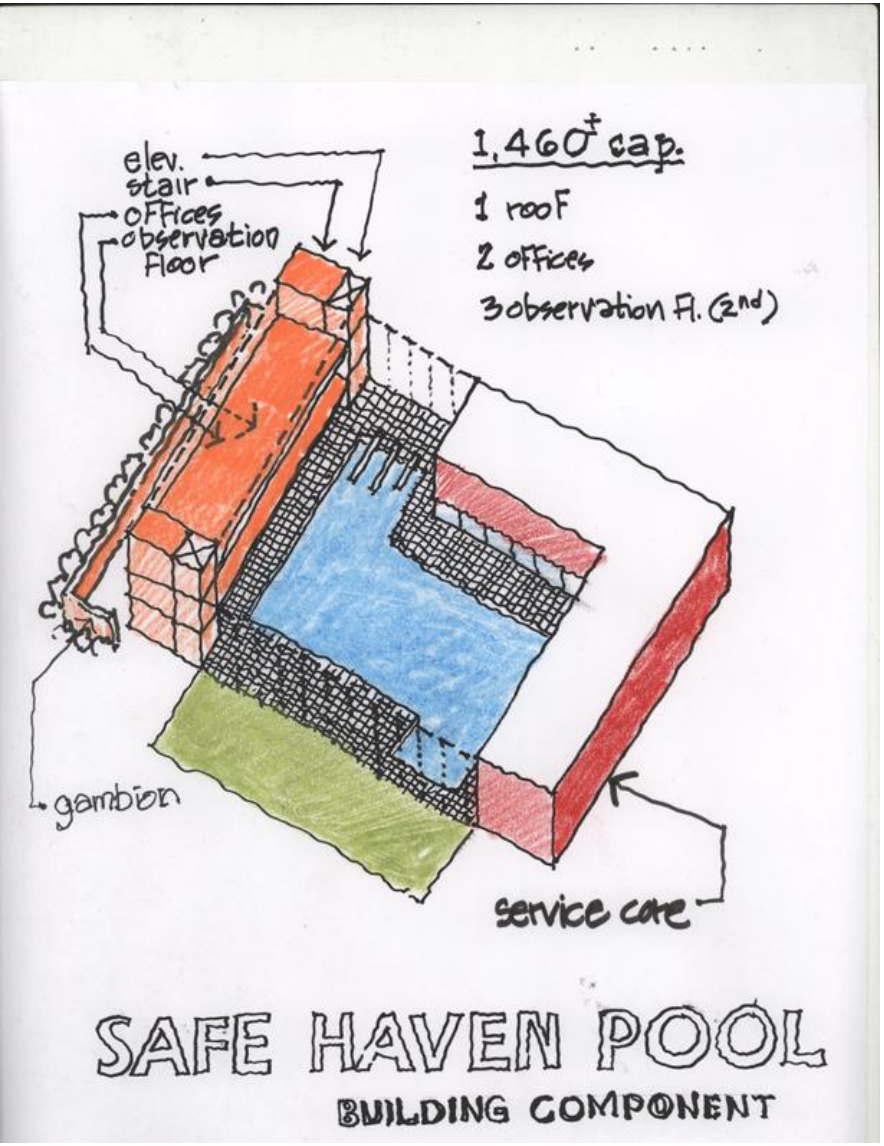
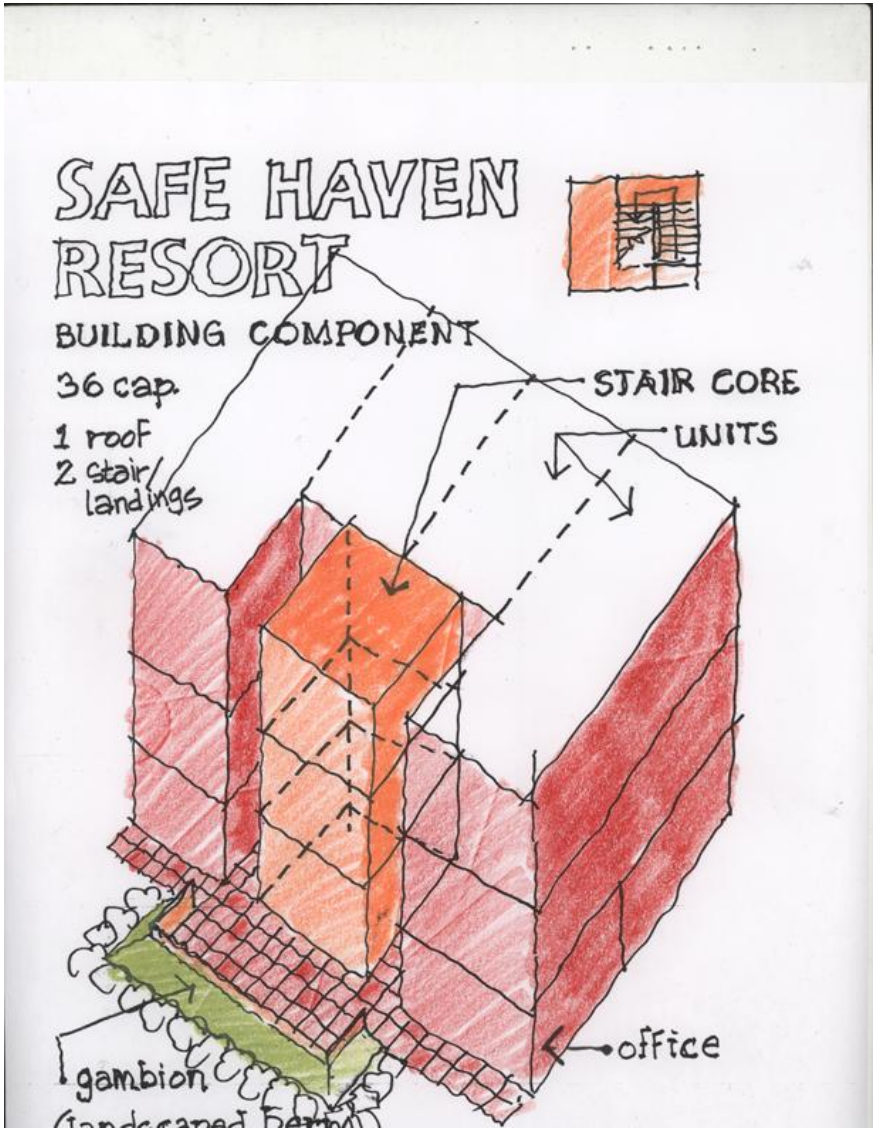


Figure 23: The La Push preferred strategy includes a tower
A conceptual tower is shown here inserted into a photograph of the coast to show potential placement and design of the structure.

Safe Haven Buildings





Step 3. Figure out what the cost is…

(thank you, engineers)

Draft cost estimates for berm at Long Beach Elementary School *(1,000 person capacity)*

Table 1: Long Beach Berm	
Scope	**Cost**
Site Utilities	$49,814
Excavation-Backfill	$289,512
Concrete	$153,951
Landscaping	$74,094
Construction Totals	**$567,370**
Design Fees (8%)	$45,390
General Conditions (10%)	$56,737
Contractor Fees, O&P (15%)	$85,106
Construction Contingency (5%)	$28,369
Estimate/Design Contingency (10%)	$56,737
Project Total	**$839,708**

Step 4. Deliver a community based plan…

Pre-Event Recovery Planning

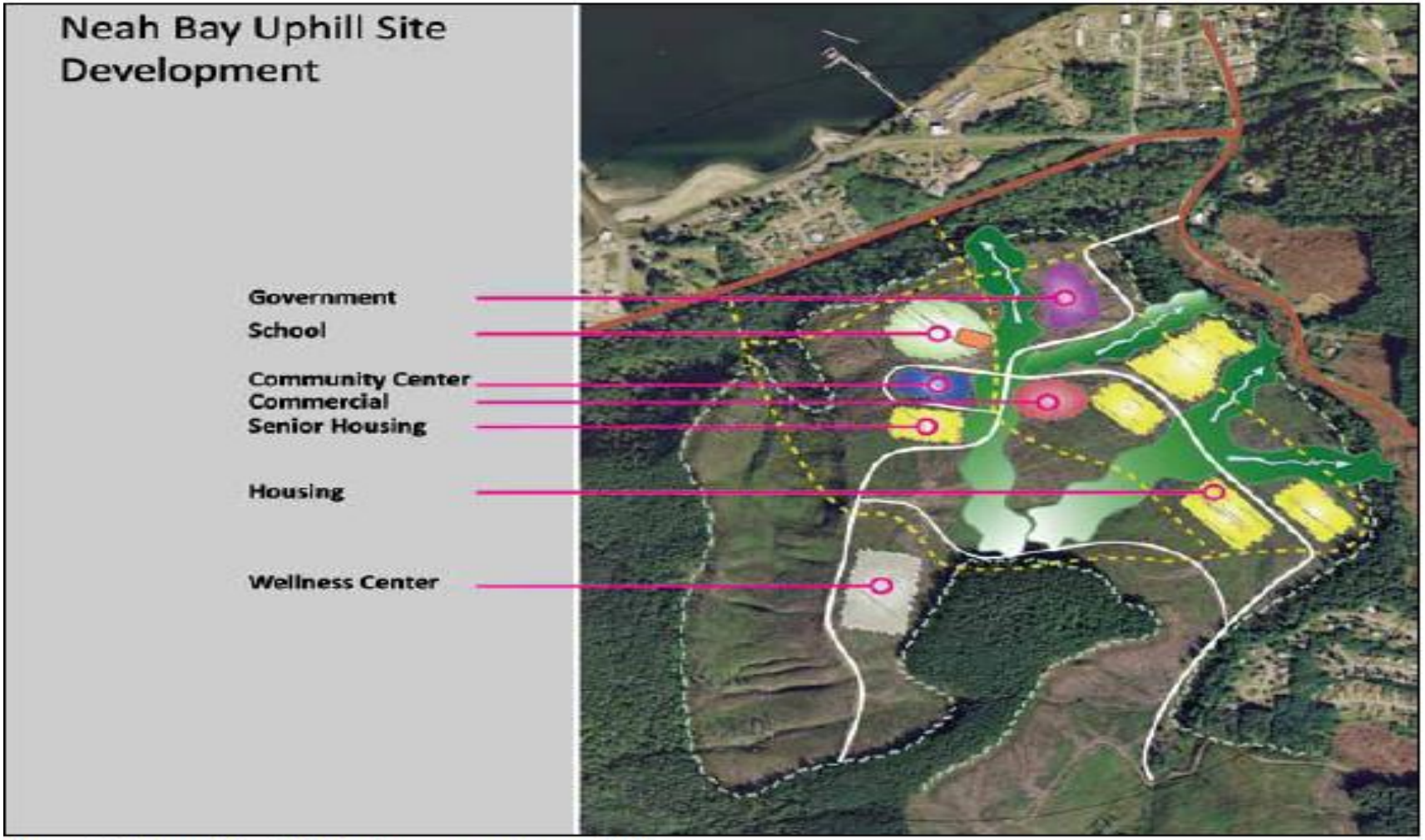


Figure 33: Potential uphill development on Cougar Hill
A phased strategy can be used to move some of the vulnerable population from coastal elevations to uphill developments, safer from tsunamis.

Next Steps:

- Minor updates to existing reports (Pacific, Grays Harbor, and Clallam) based on new modeling data
- Complete site-specific case studies for engineering design
- Continue to seek innovative approaches to funding/construction
- Outreach - “Like” us on Facebook!

Wall
Info
Photos
Discussions
Notes
Events

About
Project Safe Haven is a grassroots, community driven, public process curren...
More

265
people like this

Create a Page
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Project Safe Haven: Tsunami Vertical Evacuation on the Washington Coast

Like

Government Organization

Basic Information

Founded	2010
About	Project Safe Haven is a grassroots, community driven, public process currently taking place on the Washington Coast to identify areas for future vertical evacuation structures.
Description	Project Safe Haven: Reports & Documents https://catalyst.uw.edu/workspace/wiserjc/19587/
General Information	Project Safe Haven is a coordinated effort between the following organizations: Washington Emergency Management Division (EMD) University of Washington Hazard Mitigation Institute Washington Department of Natural Resources NOAA National Tsunami Hazard Mitigation Program County and Tribal Emergency Management Agencies
Mission	To develop a community responsive vertical evacuation strategy, in partnership with local residents, along the Washington Coast.
Email	wiserjc@gmail.com
Phone	541-510-3554
Website	https://catalyst.uw.edu/workspace/wiserjc/19587/